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ABSTRACT

The purpose of this study was to compare Interactive Televised Video (ITV) student satisfaction in performance and its predictors for two settings--one with two sites connected, each seeing the other simultaneously (point-to-point), and one with three to five sites connected, each seeing only one of the other sites at a time (multipoint). Subjects were students at Grand Valley State University (Michigan); 237 students participated in 10 point-to-point courses, and 120 students participated in four multi-point courses. Several Likert scale questionnaires were used to measure predictors of satisfaction. Other variables assessed were number of sites, numbers of students in the ITV courses, student distance from main campus, and the requirement of the ITV course. A difference in satisfaction in performance in these two settings was not found, but there was a difference in predictors. Significant predictors found in the multipoint group--self-efficacy and taking the course as a program requirement--are personal characteristics and not related to classroom dynamics. However, for the point-to-point group the significant predictors were interpersonal characteristics--nonverbal immediacy of instructor, feelings toward students at other sites, and feeling a part of the class. Three tables present data on significant findings. Contains 16 references. (Author/DLS)

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ED 428 665

The Effects of Two Modes of Interactive Televised Video

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Abstract: The purpose of this study was to compare ITV student satisfaction in performance and its predictors for two settings - one with two sites connected, each seeing the other simultaneously, and one with three to five sites connected, each seeing only one of the other sites at a time. A difference in satisfaction in performance in these two settings was not found but there was a difference found in its predictors.

1. Introduction

With rising educational costs and decreasing resources available to meet them, many students are delaying college until after they have gotten jobs and started having their families. This has contributed to a growing need for alternatives to the traditional mode of classroom instruction. These must be designed to meet the needs of these students who have restricted travel schedules.

Historically, colleges and universities offered correspondence courses to serve such students. These courses, however, offered little personal interaction between student and teacher and no interaction between students. Today, technology can meet the student need for conserving travel time and still offer some of the interaction experienced in the traditional classroom through two-way interactive televised video (ITV). However, using it is very expensive. One way to enhance its cost-effectiveness is to increase student enrollments. This can be done by increasing the number of sites. In doing so, it is imperative that ITV continues to offer learners the satisfaction necessary to perpetuate interest.

Little research has been done to investigate student satisfaction in voice-activated ITV with only one of several connected sites visible at a time. This mode of instruction may minimize potential for interactivity since class size is usually increased and since the teacher does not see all students at all sites at all times. However, preparing teachers for its use may enable them to overcome the barriers of this mode of instruction, producing as much interactivity in this setting as in the simultaneously-viewed point-to-point setting where students and teacher at one site and students at the other site can see each other continuously.

A determination of student satisfaction in voice-activated multipoint distance education can reduce the institutional risk of spending money on a mode of instruction that may not be efficient. Additionally, the determination of predictors of student satisfaction can be helpful to those institutions that have already invested in this mode of instruction since identification of these factors can be utilized to improve ITV programs.

2. Related Literature

Pinpointing predictors of satisfaction in ITV is a challenge; many factors are considered influential. These include the class size (Scheck and Others, 1994); the functioning of the technology to provide clarity of picture and sound (Hackman and Walker, 1990, and Johnson and Silvernail, 1994); course availability (Wakamatsu and Obi, 1990, and Jurasek, 1992); learner autonomy (Moore, 1977); learning style (Atman, 1991, Ehrman, 1991, Gibson, 1991, and Billings, 1991); teaching style and strategies (Moore and Thompson, 1990, Hyatt, 1992, Price and Others, 1994, Comeaux, 1995, and McHenry and Bozik, 1995); interaction with teacher and other students (Holmberg, 1981, Barker, 1989, Catchpole, 1988, Kitchen and Kitchen, 1988, Nelson, 1985, Cvancara and Peters, 1989, Pirrong and Lathen, 1990, and U.S. Congress, 1989); teacher experience and perception of ITV (Baker and Hansford, 1990); and amount of information received (Walker and Hackman, 1991).

3. Research Technique

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3.1 Design

A quasi-experimental two-group posttest was used to find differences in satisfaction in performance. It was developed by the researcher. Student ratings were recorded on a continuous scale.

Likert scale questionnaires were used to measure predictors of satisfaction. These included the Demographic Survey and Motivated Strategies for Learning Questionnaire, developed by the National Center for Research to Improve Postsecondary Teaching and Learning (NCRIPTAL); University of Michigan Problem Solving Survey, developed by Berger; Closure/Flexibility Concealed Figures Assessment, developed by Thurstone and Jeffrey; Student Survey of Instruction with instructor Verbal Immediacy and Nonverbal Immediacy Scales developed by Gorham, Richmond and McCroskey; Grand Valley State University Interactive Television Student Survey, developed by Major; and Student Survey of Distance Learning and Distance Survey of Instruction, developed by the researcher. The predictors included:

1) student motivation and learning strategies
2) student field dependence
3) student problem solving types
4) student grade expectancy
5) student intrinsic and extrinsic motivation
6) student ITV orientation and experience
7) student perception of the technology in ITV course
8) student demographic characteristics including gender, program of study, and age
9) student feelings toward students at other sites
10) student feeling part of class
11) student use of the fax, microphones, videotaped class sessions, and their ability to get materials from the library
12) student ability to hear and see the teacher
13) student ability to hear and see other students
14) teacher ability to hear and see students
15) teacher nonverbal and verbal immediacy
16) teacher visits to sites
17) teacher instructional style
18) teacher ITV orientation and experience
19) teacher ITV pay compensation
20) teacher use of zoom
21) teacher use of zoom
22) teacher perception of ITV importance

Other variables assessed were number of sites, numbers of students in the ITV courses, student distance from main campus, and the requirement of the ITV course.

3.2 Treatment and Setting

This study was conducted at Grand Valley State University (GVSU) in Grand Rapids, Michigan. This institution has North Central Accreditation and an enrollment of more than 13,000 students in graduate and undergraduate degree programs.

GVSU has replaced the use of satellite for serving students in surrounding areas with ITV instruction offered in two settings, point-to-point with 2 sites connected and multipoint with 3 to 5 sites connected.

In these settings, the classroom configuration allows each site to act as the host site with other sites acting as remote sites. Two monitors are in the front of each room. The one on the left always indicates what is being transmitted from that room (a graphic, the instructor, or student/s). The one on the right in the point-to-point setting displays what is being received from the other site and in the multipoint setting displays what is being sent from the site activating the broadcast.

3.3 Sample Population

The subjects in this study were volunteer college students enrolled at Grand Valley State University in Grand Rapids, Michigan. There were 237 students who participated in 10 point-to-point courses and 120 students who participated in 4 multipoint courses. These courses represented a wide range of disciplines.

Comparability of the groups was explored. It was found that the groups had no significant differences in year of high school graduation, ethnicity, or gradepoint but the point-to-point group did have a significantly higher proportion of males.

4. RESULTS AND CONCLUSIONS

4.1 Research Question Results

The research methodology was designed to answer the following questions:

1) Is there a difference in the satisfaction in performance of students participating in point-to-point with two sites connected) and multipoint courses with three or more sites connected)?
2) Is there a difference in the predictors of satisfaction of students participating in point-to-point and multipoint courses?

Research hypotheses expressed below were tested using regression analyses. The Null Hypotheses 1 was accepted and the Null Hypothesis 2 was rejected. The Alternative Hypothesis 1 was rejected and the Alternative Hypothesis 2 was accepted (Tables 1 and 2).

Null Hypotheses (Ho):

1) There is no significant difference in satisfaction in performance for students participating in point-to-point and multipoint courses.
2) There is no significant difference in the predictors of student satisfaction of performance for students participating in point-to-point and multipoint courses.

Alternative Hypotheses (Ha):

1) There is a significant difference in student satisfaction of performance for students participating in point-to-point and multipoint courses.
2) There is a significant difference in the predictors of course satisfaction in performance for students participating in point-to-point and multipoint courses.

Table 1--Significant Difference in Satisfaction in Performance of Students in Point-to-Point and Multipoint ITV n=346

Research Question	Result
Is there a difference in the course satisfaction in performance of students participating in point-to point and multipoint distance education? Research Hypotheses: Ho: There is no significant difference in course satisfaction in performance of students participating in point-to-point and multipoint distance education. Ha: There is a difference in course satisfaction of students participating in point-to-faction and multipoint distance education.	Regression Analysis: Point-to-Point/Multipoint F-ratio = 0.418 Not Significant t-ratio Probability Constant ..... 0.0001 Point/Multipoint ..... R-squared = .001 Adjusted R-squared =.002 Findings: At alpha = .05, it can be concluded that there was no significant difference in the course satisfaction in performance in the two groups. Conclusion: Fail to reject Ho.

Table 2--Significant Difference in Predictors of Satisfaction in Performance of Students Participating in Point-to-Point and Multipoint ITV

Research Question	Result
Is there a difference in satisfaction of point-to-point and multipoint ITV courses? Research Hypotheses: Ho: If ITV courses are offered in point-to-point and multipoint settings, there is no difference in predictors of course satisfaction in performance. Ha: If ITV courses are offered in point-to-point and multipoint settings, there is a difference in predictors of course satisfaction in performance.	Regression Analysis Point-to-Point n=87 F-ratio = 12.5 Significant t-ratio Probability Constant ..... Grade Expectancy 3.57..... 0.0006 Nonverbal Immediacy 2.41..... ..... Feelings Toward Students 2.22 ..... 0.0295 Feeling Part of Class 2.77..... 0.0068 R-squared = 3.78 Adjusted R-squared = 3.48 Multipoint n=237 F-ratio = 13.7 Significant t-ratio Probability Constant 7.27 0.0001 Grade Expectancy 2.69..... 0.0103 Self-Efficacy 2.76..... 0.0084 College Requirement .... R-squared = .440 Adjusted R-squared = .412 Findings: At alpha = .05, it can be concluded that there is a difference in predictor variables of Satisfaction of Performance. Conclusion: Reject Ho; accept Ha.

5. Conclusions

There was no significant difference found in Satisfaction in Performance of students (Table 1). There were differences found, however, in the predictors (Table 2). Only grade expectancy was found to be a common significant predictor in both point-to-point and multipoint groups. With additional analyses, it was found to be a significant predictor at host and remote sites for both groups (Table 3).

Nonverbal communication of teachers, feeling part of the class and having positive feelings toward students at other sites were significant in the point-to-point group but not in the multipoint group (Table 4). With additional analyses, the researcher found that nonverbal communication of teachers was a significant predictor at both host and remote sites while feelings toward students at other sites and feeling part of the class were only significant at the remote site (Table 3).

For multipoint students, taking the class as a college requirement was a predictor of lower satisfaction in performance. This was true, however, only at the host site. Self-efficacy was also a significant predictor and was significant at both host and remote sites (Tables 2 and 3).

Table 3--Significant Predictors of Student Satisfaction in Performance at Host and Remote Sites

Research Question	Results
Is there a difference in Satisfaction in Performance for students participating in point-to-point and multipoint ITV courses at host and remote sites? Research Hypotheses: Ho: If ITV courses are offered in point-to-point and multipoint settings, there is no difference in predictors of Satisfaction in Performance. Ha: There is a difference in predictors of Satisfaction in Performance at host and remote sites.	Regression Analysis Host Site n= 201 F-ratio t-ratio Probability Grade Expectancy ..... College Requirement 7.94 ....-2.82 0.0054* Self-Efficacy 17.9 4.23 ..... Feeling Part of Class ..... Feelings Toward Students 2.47 1.75 0.1189 Nonverbal Immediacy 6.04 5.66 0.0153* Remote Site n=148 F-ratio t-ratio Probability Grade Expectancy ..... College Requirement ..... Self-Efficacy 8.23 5.92 0.0049* Feeling Part of Class ..... Feelings Toward Students 5.59 3.36 0.0202* Nonverbal Immediacy 6.54 2.56 0.0001* Findings: At alpha = .05, it can be concluded that there is a difference in predictor variables of Satisfaction in Performance at host and remote sites. Conclusion: Reject Ho; accept Ha.

5.1 Generalizability of Sample

Since this was a university study, its results may not be generalizable to students younger than adults.

5.2 Important Findings

The researcher conducted an exhaustive review of literature and found no previous studies that compared satisfaction and predictors of satisfaction in performance of students in point-to-point settings to those in multipoint settings. This study explored these to answer important questions related to distance education in the context of increasing alternatives available through ITV technology.

While Scheck and others indicate that large class size has been found to negatively affect student performance, the results of this study indicated that there was no difference in the satisfaction of performance of students in the point-to-point settings and in the multipoint settings. The researcher recommends that educational institutions advance administrative incentive to transmit to more sites from one classroom, thereby, enhancing numbers of students receiving educational services.

Additionally, the results of this study indicated that there was a difference in predictors of course satisfaction in these two groups. The significant predictors, self-efficacy and taking the course as a program requirement, found in the multipoint group are personal characteristics and not related to classroom dynamics. This is not true, however, for the point-to-point group for whom the significant predictors were interpersonal characteristics - nonverbal immediacy of instructor, feelings toward students at other sites, and feeling a part of the class.

These findings indicate that instructors in the point-to-point setting need to be especially cognizant of their nonverbal behavior directed to both host and remote sites. These include teacher's use of gestures, use of monotone voice, practice of looking at the class, practice of smiling at the class, display of tense body position, practice of moving about the room, habit of looking at the board or notes while talking to the class, practice of smiling at individual students in the class and use of a variety of vocal expressions when talking to the class. Findings also

indicate that instructors in this setting need to be sensitive to student feelings toward others and feeling part of the class. These predictors were consistent with the assertions made by Holmberg, Barker, Catchpole, Kitchen and Kitchen, Nelson, Cvancara and Peters, and Gorham and McCroskey who emphasize the importance of student interaction and teacher immediacy. Additionally, they challenge the results of research done by Walker and Hackman who suggest that students in these are willing to trade off their socio-emotional needs for contact with the instructors and rapport with classmates for the currency of telecourse information.

The influence of these predictors were "washed out" when multiple sites participated in this mode of instruction and were replaced by self-efficacy and the requirement of the ITV class. In this setting, the sense of isolation at the remote sites may be reduced by the sharing of remote site frustrations at one site with students at the other sites. The old adage "misery loves company" may be manifested here.

College requirement in the multipoint group negatively influenced course satisfaction at the host site but not at the remote site. One reason for this may be that students at the remote site desire to take as many courses as possible using this mode of instruction to experience the benefit of reduced travel. These students may be willing to deal with the challenges of ITV. In fact, Walker and Hackman indicate that amount of information transferred is the primary determinant of learning and satisfaction in telecourses. Students at the host site, however, may be less satisfied with their performance in this context because they are required to face the related difficulties without any benefit to them. The frustrations of ITV may be further enhanced for these students when the ITV course is important in their program and the need to comprehend course concepts and to obtain a good grade is optimal.

Choice may be a very important factor in overall course satisfaction. To provide it for all students, it may be appropriate to: (a) have instructors teach from empty classrooms on campus to students at distant sites desiring the ITV course, and (b) provide the instructor the training needed to enhance nonverbal immediacy of instructor and the interactivity needed for students at the remote sites to feel a part of the class and to have a positive feeling toward students at the host site.

Additionally, it was found that Self-efficacy was a predictor at both host and remote sites in the multipoint setting but was not a predictor in point-of-point settings. The researcher emphasizes that academic performance may be a great concern for students in the multipoint setting since classroom dynamics is very complex. This environment, which has much camera switching, may be overwhelming to some. Those, in this setting, who have a better sense of ability to do well, consequently, are more satisfied with the course. Students who struggle with mastering course content should not be encouraged to learn in this setting without given much support.

5.4 Suggestions for Future Research

To verify the findings of this study and to explore other ITV areas of interest, the researcher suggests the following:

1) Replicate this study using more point-to-point and multipoint classes, instructors, and courses.
2) Investigate reasons that feelings toward students at other sites, feeling part of class, and nonverbal teacher behavior are predictors of student satisfaction in performance in point-to- point ITV distance education and not in multipoint ITV distance education.
3) Investigate reasons that self-efficacy is a predictor of student satisfaction in performance in multipoint ITV distance education and not in point-to-point ITV.
4) Investigate the variables for student motivation and learning strategies, student problem solving types, and intrinsic motivation. These variables had moderately strong relationships to Satisfaction in Performance for the multipoint setting but were not included in the regression model as predictors. The omission of these variables may be due to interaction with Grade Expectancy. Further investigation of these is recommended in future study of ITV.

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